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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/767,875

01/29/2004

Young-Jun Kim

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01/31/2005

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EXAMINER

WALKER, KEITH D

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 01/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

28

Office Action Summary

Application No.

10/767,875

Applicant(s)

KIM ET AL.

Examiner

Keith Walker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-4, drawn to a method of making an electrode, classified in class 429, subclass 121.
 - II. Claims 5-9, drawn to a method of making a battery, classified in class 29, subclass 623.1.
 - III. Claims 10-11, drawn to a Lithium battery, classified in class 429, subclass 57.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as a negative electrode for any type battery or fuel cell and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if

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the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

3. Inventions I and III are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as an electrode for any battery, such as a metal-air, nickel hydride, or a fuel cell and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

4. Inventions II and III are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by a materially different process such as ventilation drying.

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5. The examiner has required restriction between product and process claims.

Where applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims that depend from or otherwise include all the limitations of the allowable product claim will be rejoined in accordance with the provisions of MPEP § 821.04. Process claims that depend from or otherwise include all the limitations of the patentable product will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier.

Amendments submitted after final rejection are governed by 37 CFR 1.116;

amendments submitted after allowance are governed by 37 CFR 1.312.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

7. Because these inventions are distinct for the reasons given above and the search required for Groups I & II is not required for Group III, restriction for examination purposes as indicated is proper.

8. During a telephone conversation with Bruce Prout on January 10, 2005 a provisional election was made without traverse to prosecute the invention of Group III, claims 10-11. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-9 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

9. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one

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or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Priority

10. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 10/767875, filed on January 29, 2004.

Information Disclosure Statement

11. An Information Disclosure Statement has not been filed as of the writing of this office action.

Drawings

12. The drawings received on *** are acceptable for examination purposes.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claim 10 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by the non-patent literature article "Degradation mechanism of alkyl carbonate solvents used in lithium-ion cells during initial charging" (Yoshida et al).

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Yoshida describes a lithium battery containing the same elements as stated in the specification of the instant application. Electrodes of lithium cobalt oxide and graphite are used, along with solvents of ethylene carbonate and dimethyl carbonate (Abstract). Table 1 shows a comparison of the generated gases at initial charging, where two results are shown, 28.7 volume % and 20.2 volume %, with a production of carbon monoxide (CO) less than the claimed 30 volume %.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 10 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over non-patent literature article "Degradation mechanism of alkyl carbonate solvents used in lithium-ion cells during initial charging" (Yoshida et al).

Regarding claim 10, Yoshida describes a lithium battery containing the same elements as stated in the specification of the instant application. Electrodes of lithium cobalt oxide and graphite are used, along with solvents of ethylene carbonate and dimethyl carbonate (Abstract). Table 1 shows a comparison of the generated gases at initial charging, where two results are shown, 28.7 volume % and 20.2 volume %, with a production of carbon monoxide (CO) less than the claimed 30 volume %.

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Regarding claim 11, Yoshida's experiment as stated above shows the volume % of hydrogen gas close to but not within the range of the instant claim. However, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to change variables in the experimental phases to generate optimum values. Such variables can include varying the quantity of hydrogen producing elements, the length of drying time, the temperature of the drying process, or any combination thereof. It is held that discovering an optimum value of a result effective variable involves only routine skill in the art. (In re Boesch, 617 F.2d 272, 205 USPQ 215). It is held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

17. Claims 10 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over non-patent literature article "Degradation mechanism of alkyl carbonate solvents used in lithium-ion cells during initial charging" (Yoshida et al), in view of non-patent literature article "Electrochemical insertion of sodium into hard carbons" (Thomas).

The teachings of Yoshida as taught above are incorporated herein.

Regarding claim 10, teaches the volume % of carbon monoxide to be under the claimed 30 volume % as stated above.

Yoshida teaches a hydrogen gas range with a minor difference in value compared to the instant claims.

Thomas teaches the hydrogen content of carbon fibres as a function of the heat-treating temperature (Abstract). The effect of high temperature treatment can result in the modifications of the access of the metal species into the porous domain of the carbon material (Results and discussion, pg. 3304). Thomas further teaches the use of M40 carbon fibres having a hydrogen content of about 0.40%. With the volume of hydrogen being an approximate value the lower limit would be within the scope of the instant claim. It is held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the graphite of Yoshida with the carbon of Thomas to produce a cell with low hydrogen generation in order to reduce the pressure rise in the battery.

18. Claims 10 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,573,004 (Igarashi).

Igarashi describes a rechargeable lithium battery made of graphite and lithium transition metal oxide (Col. 1, ll. 40-57). The positive electrode is prepared with lithium cobalt oxide and coated on a current collector of aluminum foil (Col. 10, ll. 21-33). The negative electrode is prepared using graphite and a binder mixed in a liquid medium

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and then coated on a current collector of copper foil (Col. 10, ll. 35-48). The coated slurry is vacuum dried at a temperature in the range of 80-350 deg. C (Col. 9, ll. 8-14). The possible binders are styrene-butadiene and cellulose compounds such as methyl cellulose and ethyl cellulose (Col. 6, ll. 13-46).

Although the instant claims do not reference a method of making the claimed lithium battery, the examiner used the process presented in the specification as a guideline for the method.

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to make a battery using the products, the process and the teachings of Igarashi, all of which are equivalent to the applicant, and expect similar results as to the instant claims.

Therefore it is shown that the teachings of Igarashi are obvious over the applicant's claims. Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith Walker whose telephone number is 571-272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kdw


PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER